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ABSTRACT

The purpose of this guide is to give an up-to-date presentation of the information service offered by the documentation center at the Royal Institute of Technology (RIT) and to facilitate the utilization of the service. The guide gives a general account of the multidisciplinary computerized current awareness service (SDI) and a detailed description of the profiling system, including profile construction techniques and profile maintenance methods and routines. Included in this guide are descriptions of: the data bases included in the SDI service, processing of magnetic tapes, the construction of search profiles, comments on the profile print-out and on the list of references for the profile, evaluation and feedback methods, statistics compiled, contacts with users, subscription fees, etc. (Author/SJ)

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SELECTIVE DISSEMINATION OF INFORMATION AND RETROSPECTIVE SEARCHES COMPUTER BASED INFORMATION SERVICES FROM RIT

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SEPTEMBER 1973

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Selective Dissemination of Information
and Retrospective Searches
Computer based documentation services
from RIT

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List of contents.

	page
Foreword	1
Introduction: General background	2
Brief description of the SDI service	4
Subjects	4
Data bases included in the SDI service	5
Internal data bases: MechEn and WOOD	8
The processing of the magnetic tapes	9
The construction of search profiles	11
The search profile	11
The search term	11
The profile concordance	14
Truncation	17
Search logic	17
Weighting of search terms	20
Alternative profiles	20
Comments on the profile print-out	
SDI1C	23
SDI2B and SDI2F	29
SDI3H and SDI3E	36
SDI4M and SDI4A	43
Comments on the list of references for the profile	
SDI1C	25
SDI2F	33
SDI3E and SDI3H	39
SDI4A and SDI4M	46
Evaluation and feed-back	47
The users' evaluations until 30.6.1969	47
Statistics	49
Standard profiles	53
Retrospective searches	55
Data bases available for on-line search	56
Access to the notified literature	56
The contact with the users	57
User training programme	58
Subscription fees	58
Conclusion	59
References	60

Foreword.

The purpose of this guide is to give an up-to-date presentation of the information service offered by the documentation centre at the Royal Institute of Technology - RIT - and to facilitate the utilization of the service.

The guide gives a general account of our multidisciplinary computerized current awareness service - SDI - and a detailed description of the profiling system, including profile construction techniques and profile maintenance methods and routines.

The information processing system - ABACUS - which was used during the first four years had been developed by the RIT Library in collaboration with the Swedish Nuclear Establishment AB Atomenergi under the guidance and initiative of the head librarian, Dr Björn Tell.

The recently adapted and implemented system - VIRA - is a result of development work introducing changes and new techniques to the ABACUS system to such an extent that it can be considered a wholly new system, a second generation of ABACUS.

Those users who entered their subscriptions to the RIT documentation service at an early stage will therefore find many novelties and changes in most of the centre's activities.

The phasing in of the new system started at the beginning of 1972 and has been executed successivly in order to avoid breaks in the service to the subscribers.

The computerized documentation service at the RIT Library is conducted with financial support from the Swedish Council for Scientific and Technical Documentation - SINFDOK - and from the Office of the Chancellor of the Swedish Universities.

It is my hope that this guide will be found helpful to our present and prospective users and encourage further cooperation and interaction between the documentation centre and its users.

Introduction: General background.

Besides its educational functions for the Institute and other Swedish universities the RIT Library has , since its early beginnings, been responsible for the task of providing Swedish scientists and industrial communities with direct and immediate access to the publications and information required in their work.

The progress in technology and the results of scientific research are mostly reported in the current literature in form of articles in periodicals.

The exponential growth of scientific research has brought about a corresponding increase in the literature of all subjects, so that the scientists cannot survey on their own the results of research and development going on in their fields of interest.

This exponential growth of scientific literature made it impossible for our library to fulfil its task by using traditional methods. Being a centre for scientific and technical literature the library tried to meet the need for an effective system for retrieval and dissemination of information by applying the new methods of computerized information processing.

In October 1967 the library received its first grant for a research project to investigate the problems of retrieval and dissemination of information with emphasis on a current awareness service in the fields of science and technology in the form of a computerized SDI - Selective Dissemination of Information - service.

The aims of the project also includes the provision of retrospective searches in batch processing as well as on-line interactive modes.

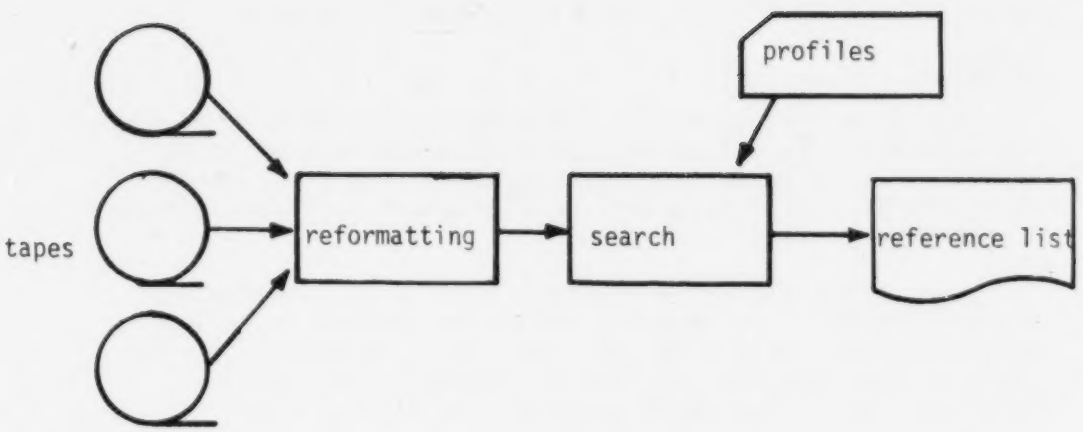
The SDI-service at the RIT Library has been available since July 1969 to scientists,research workers, and engineers in the whole country. The service was started, and is conducted, with financial support from SINFDOK as part of a national scheme of investments to support technical research and industrial development. The service was originally aimed at engineering science and technology, but the growing insight into the impact of science and technology on human life, into its social function and ecological effects has brought with it the realization that scientific research is to an ever larger extent becoming multi- and interdisciplinary.

The scientific and technical subject fields get more and more involved with other subjects and do often overlap them. Many subject fields outside natural science and technology are thus covered in scientific and technological information sources and services. The effect is that a considerable number of research workers from other scientific fields, such as social science and education, subscribe to our SDI service.

The SDI service is an integrated part of the library. The library gives a prompt access to the notified literature in its own collection which at present includes about 7,000 periodicals. Literature from other libraries in the country and abroad can be made available through the library via a comprehensive network.

The RIT Library is no longer just a library in the conventional meaning of the word but rather an information center serving universities, industries and research workers all over the country.

Fig 1. The SDI system.



Brief description of the SDI service.

The library subscribes to magnetic tapes containing references to the newly published scientific literature. The user's subject fields are entered into the system on a computer readable medium in the form of a so called search profile, which contains search terms significant for the query, for instance words in the title of documents, authors, institutions, key words, descriptors etc.

Each time a magnetic tape is received by the library the references are fed to the computer and the references on the tape are compared with the search terms in the search profiles. When a notation on the magnetic tape coincides with any terms in a search profile this is registered by the computer and results in an output in form of individual lists of references according to the subscriber's query.

At present 16 different data bases are being searched at the documentation department, three of which are generated internally. The external data bases are mainly received on leasing or licensing basis and in some cases on cooperation or exchange basis.

Subjects.

The data bases included in the SDI system at the RIT Library cover the literature associated with the disciplines included in and connected to the educational and research programme at the Royal Institute of Technology as well as all subject fields of interest to the Swedish industrial community.

The magnetic tapes contain references to literature within the fields of mathematics, physics, chemistry, chemical technology, information processing, computer and control technology, nuclear physics, food chemistry and food technology, paper chemistry, metallography, environmental research, electronics, electrical engineering, mechanical engineering and other scientific disciplines and subject fields.

There exists a corresponding printed version to most of the magnetic tapes. Some data bases are discipline-oriented or society-based and cover a special scientific discipline like e.g. Physics Abstracts and Chemical Abstracts Condensates.

Some data bases are mission-oriented covering a certain branch or a certain subject field and cutting several disciplines like e.g. Nuclear Science Abstracts and Food Science and Technology. These are interdisciplinary.

Other data bases are multidisciplinary covering several subject fields and branches like e.g. Compendex and Science Citation Index Source Tapes. (See list of data bases.)

Data bases included in the SDI service.

ISI — SCIENCE CITATION INDEX SOURCE DATA TAPE from the Institute for Scientific Information (USA) contains interdisciplinary information from the most frequently cited journals in science and technology and is enlarged by about 400 000 references a year. The data base contains information about the author, title, the title of the source publication, volume, year of publication, issue, number of pages, language code and number of references cited. The tapes are issued weekly. The printed version is issued quarterly.

MechEn — MECHANICAL ENGINEERING from the Royal Institute of Technology, Stockholm. This data base adds 40 000 references a year covering the fields of mechanical engineering from 200 journals. The references are presented in the printout in the same way as those from the ISI tapes. The tapes are issued weekly. No printed version exists.

CAC — CHEMICAL ABSTRACTS CONDENSATES from Chemical Abstracts Service (USA) adds about 380 000 references a year covering journal articles, konference papers and patents in the field of chemistry. The data base contains information about author, title, key word, Chemical Abstracts' section number and abstracts number; volume, issue, year of publication, page number of the source publication, institution/organisation, and for patents: patent number and priority. The tapes are issued weekly.

INSPEC — INFORMATION SERVICE IN PHYSICS, ELECTROTECHNOLOGY AND COMPUTERS & CONTROL from the Institution of Electrical Engineers (U.K.) in collaboration with the American Institute of Physics and the Institute of Electrical and Electronics Engineers (USA). This is the most comprehensive information system within the fields given in the title and it adds about 150 000 references a year. The data base contains information about the author, title, classification code, aspect code, key word, the title of the source publication, volume, year of publication, issue, page number, publicating country, language code, number of cited references, institution/organisation, patent number and report number. The tapes are issued every second week.

Metadex — METALS ABSTRACTS INDEX TAPES from the American Society for Metals in collaboration with the Institute of Metals (U.K.) adds about 25 000 references a year, covering literature in the field of metallurgy. The data base contains information about author, title, key word, the title of the source publication, volume, year of publication, issue, page number, patent number, and MA abstracts number. The tapes like the printed version are issued monthly.

.RA GOVERNMENT REPORTS ANNOUNCEMENTS from the National Technical Information Service (NTIS) USA adds about 60 000 references a year covering reports on US federal sponsored research in the field of science and technology. The data base contains information about author, title, classification (COSATI), descriptors, report number and abstracts number, institution/organisation, total number of pages in the report, report date, availability, abstracts and other annotations. The tapes are issued every second week. The printed version is published under the same title: GRA.

'OMPENDEX COMPUTERIZED ENGINEERING INDEX from Engineering Index Inc.(USA) covers the literature in engineering and technology and adds about 85 000 references a year. The data base contains information about author, title, subject field, abstracts, title of the source publication, volume, year of publication, issue page number, patent number, title in original language, institution/organisation and EI abstracts number. The tapes are issued monthly like the printed version.

'SA NUCLEAR SCIENCE ABSTRACTS from the United States Atomic Energy Commission adds about 61 000 references a year. Literature searching on the NSA data base is carried out in close collaboration with AB Atomenergi. The data base contains information about author, title, key word, classification code, title of the source publication, volume, year of publication, issue, page number, report number and patent number, language code, institution/organisation and NSA abstracts number. The tapes like the printed version are issued every second week.

ABIPC ABSTRACT BULLETIN OF THE INSTITUTE OF PAPER CHEMISTRY from the Institute of Paper Chemistry (USA) adds about 12 000 references a year covering recently published journal articles, patents and theses in the field of pulp and paper chemistry and technology. The data base contains information about author, title, title of the source publication, volume, year of publication, issue, page number, patent number, language code and ABIPC abstracts number. The tapes are issued monthly like the printed version.

WOOD WOOD from the Swedish Forest Products Research Laboratory and the Library of the Royal Institute of Technology, Stockholm adds about 7 000 references a year in the field of wood technology. The data base contains information about author, title, title of the source publication, volume, year of publication, issue, page number, language code and number of cited references. The tapes are issued monthly. No printed version exists.

FSTA FOOD SCIENCE AND TECHNOLOGY ABSTRACTS from the International Food Information Service (Germany) covers the literature in food science and chemistry and adds about 15 000 references a year. The data base contains information about author, title, title of the source publication, volume, year of publication, issue, page, subject field, patent number, institution/organisation, number of cited references and FSTA abstracts number. The tapes are issued monthly like the printed version.

ERIC — ERIC MASTER FILES from the Educational Resources Information Center (USA) adds about 30 000 references a year covering reports and journal articles and other publications in education and modern educational technology. The printed version of ERIC consists of three parts: RIE - Research in Education - that registers and compiles scientific reports. CIJE - Current Index to Journals in Education - that contains references to journal articles and ERIC Thesaurus that contains descriptors - key words to the subject definitions in the first two parts. The data base contains information about author, title, key word, title of the source publication,volume, year of publication, issue, page and report number and RIE and CIJE abstracts number. Two magnetic tapes are issued every quarter.

CP — CURRENT PROGRAMS from World Meetings Information Center, Inc. adds about 120 000 references a year to scientific and technical papers presented at meetings. The data base contains information about author, title of the paper, date and place of the meeting and where the papers are to be published and where to order them.

TR — TECHNICAL REPORTS from the Research Library at AB Atomenergi, Studsvik, Sweden, adds about 15 000 references a year covering reports deposited at AB Atomenergi. The predominant series are: USAEC(United States Atomic Energy Commission) reports, RAND Corporation reports and reports on research sponsored by the Swedish Board for Technical Development. The data base contains information about author, title, report number, report series, subject heading and abstracts number in the printed version. The tapes are issued monthly like the printed version.

STU — STU - NEW PROJECTS. A list over new projects sponsored by The Swedish Board for Technical Development. The purpose is to give information about new projects as early as possible. The data base contains information about the heading of the project and the STU project number. The tapes are issued twice a year.

AKN NAT — ACCESSION CATALOGUE over foreign literature in Swedish research libraries adds about 10 000 references a year covering new books, monographies and congress papers in natural sciences, technology and medicin. The data base contains information about the author, title, entry word, place of publication, year of publication, total number of pages, ISBN (international standard book number) or NBN (LIBRIS book number) and library of acquisition. The tapes and the printed version are issued eight times a year.

STAR — SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS from the National Aeronautics and Space Administration (USA) adds about 45 000 references a year covering reports from all fields connected with aeronautics and space technology. The data base contains information about author, title, subject field, classification code, key word, report number, institution/organisation and STAR abstracts number. The tapes are issued semimonthly like the printed version. The tapes are accessible through the European Space Research Organization (ESRO).

IAA INTERNATIONAL AEROSPACE ABSTRACTS from the American Institute of Aeronautics and Astronautics adds about 50 000 references a year covering journals, meetings, patents and other literature in the same field as STAR. The data base contains information about author, title, title of the source publication, volume, year of publication, issue, page number, subject field, classification code, key word, patent number and IAA abstracts number. The tapes are issued semimonthly like the printed version. The tapes are accessible through the European Space Research Organization (ESRO).

Internal data bases: MechEn and WOOD.

MechEn is produced at the RIT Library. This internal data base covers 200 journals in mechanical engineering. The selection of the journals was originally made for a special group of users within The Swedish Association for Metal Transforming, Mechanical and Electromechanical Engineering Industries, the first branch organization to show an interest in the SDI service. This group of users tried and evaluated the SDI service and on the basis of their subject interest the 200 journals were selected for input. All references to articles, notes, surveys,reports and cited references from these journals are punched on tape. This data base adds 40 000 references a year and yields 50 per cent of the output for 330 search profiles within this subject field. The selection of journals is continuously controlled to cover the users' field of interest and to avoid duplication in case any of the journals would be included in any of the external data bases.

When ABIPC was included in the SDI service cooperation was established with the Swedish Forest Products Research Laboratory - STFI. As no data base then existed in the field of wood technology STFI took the initiative to start the production of WOOD in cooperation with the RIT documentation department. WOOD covers 58 journals and the input of the references is done in the same way as with MechEn.

The processing of the magnetic tapes.

Most magnetic tapes are a by-product or an intermediate product in the production of publications. They are designed according to different principles for different systems and with different aims.

The structure and scope of the references and their associated annotations as well as the logical and physical layout of records on the magnetic tapes vary with the data bases.

Many of the data base producers offer program packages for searching their data bases. These programs are usually written for a particular computer and cannot without a great deal of effort be adapted to and implemented on other computers and for other magnetic tapes.

The basic approach to these problems at the RIT Library has been to use a general format for processing which would be able to accomodate any kind of bibliographic record to be used for current awareness. This implies that a reformatting program has to be written for each data base and that every tape has to be reformatted before it can be used, but also that the same search program can be used for all data bases.

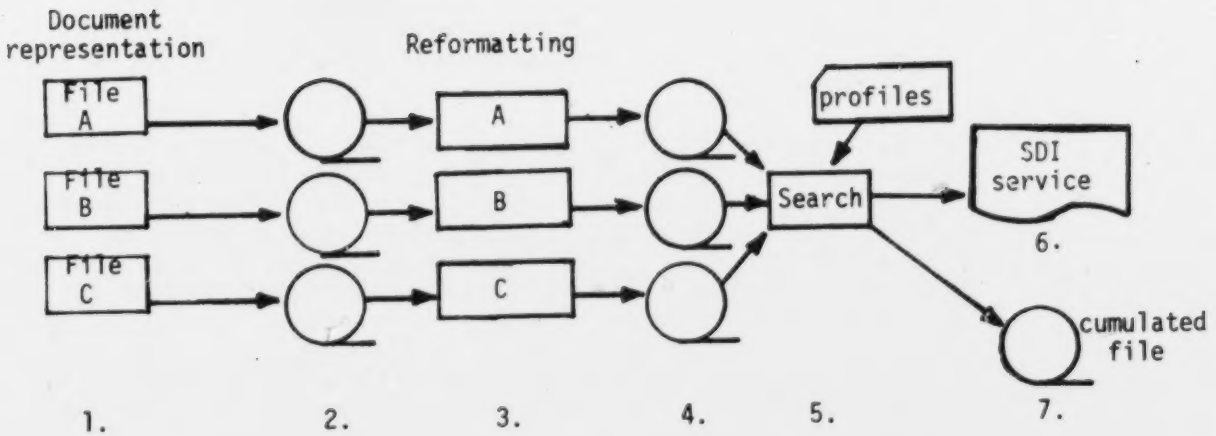
A search program designed on these principles, called ABACUS, (1) was developped already in 1966 in cooperation with the library at AB Atomenergi under the guidance of the head librarian , Dr Björn Tell. ABACUS was used during the first four years of the SDI-service.

For every data base a reformatting program converts the original format of the tapes to the ABACUS format. The compatibility between the different data bases is thus effected through the reformatting program which converts the information so that it becomes homogene in the search file. The reformatted tapes are then searched with the individual search profiles that are made according to every subscribers individual field of interest. This search procedure is identical for all the data bases. Fig 2.

In parallel with the operative SDI service the RIT Library carries on research and development work to get faster and more effective programs for the searching of large sequential files. A new search program , VIRA, has been developped by Rolf Larsson, a holder of a SINFDOK scholarship. The VIRA search program uses the hash-code technique and tree-structures and is much faster and economically more advantageous than the ABACUS search program. (2)

A new profiling program, EPOS, corresponding to the VIRA search program has been developped by a project group under the guidance of Mats Lindqvist, also a holder of a SINFDOK scholarship. The preparation of search profiles according to this system is in general the same as for ABACUS. The difference consists in an increase in the possibilities to formulate the search logic and to specify the search results by weighting of the search terms. (The weighting of the search terms and the calculation of the rank figures of the references will be treated more in detail in a following chapter.)

Fig 2. From source publication to SDI output.



1. Transfer of the references into computer readable media.

2. Reading of the references by the computer and storing of the information on magnetic tapes or other storage media.

3. Conversion of references to the ABACUS format or to another general post format.

4. Transfer of the references into magnetic tape in the new general format.

5. Searching - matching of the information on the magnetic tape with the information in the search profiles.

6. Search results - lists of references according to the queries from the subscribers.

7. Cumulated file for retrospective searches.

The construction of search profiles.

Selective Dissemination of Information - SDI - is a service giving a regular current awareness service to each subscriber in his individual field of interest. Every week, or fortnightly, each subscriber receives a list of references to the latest literature in his own field of interest. The computer readable description of a subscriber's field of interest is submitted to the system in the form of a so called "search profile."

The search profile.

A search profile is a list of terms describing a query. It is made up of technical terms or other terms significant to the query(3).

When the subscriber wants to submit a query to the SDI system he is requested to specify his field of interest in a narrative way in plain language, describing his interest in detail. It has proved to be very useful if the user also supplies some references to papers, journal articles, or reports which he considers relevant to his query. He may also provide a list of significant terms or make a draft of his own search profile. On the basis of the user's statements the subject specialists design and construct the search profile.

The construction and revision of search profiles is an essential task which demands an intellectual effort from both the user and the subject specialist. This dialogue between the user and the subject specialist is the first phase in the interaction of the SDI system and its users. Fig. 3.

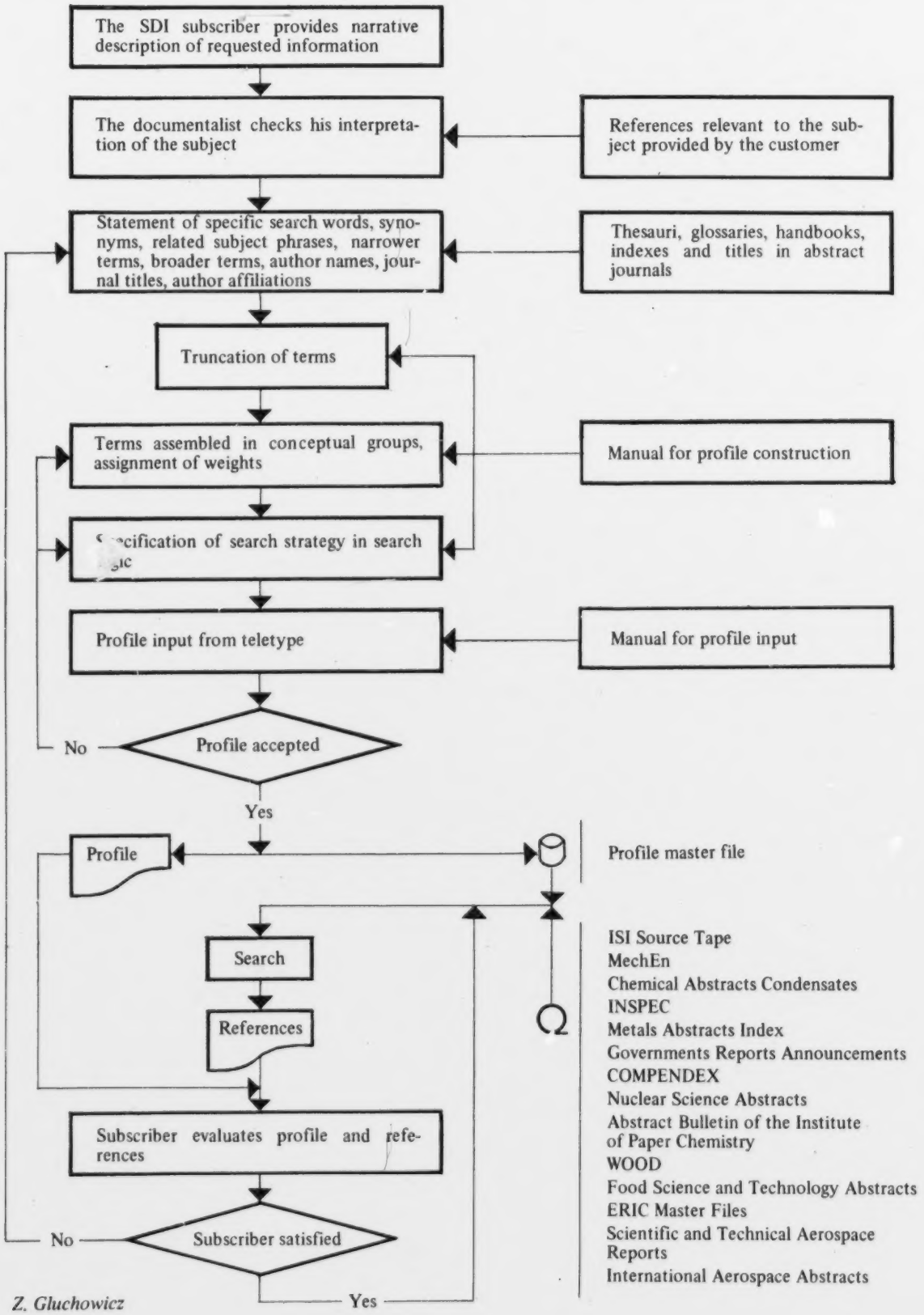
The search term.

A search term is an expression, a sequence of up to 31 signs, letters and/or figures, relevant to a special query. A search term in a search profile can be:

a single word
a sequence of words in a string
an author's name
the name of an institution/organization
the title of a journal
a descriptor
a key word
a subject heading
a classification code

A search term may occur in the reference as a description both of the contents of the document (title, key word, subject heading, classification code) and of the document itself (the title of the source publication, organization/institution, report no., patent number).

GENERALIZED FLOW CHART FOR PROFILE CONSTRUCTION


The SDI subscriber provides narrative description of requested information
The documentalist checks his interpretation of the subject
References relevant to the subject provided by the customer
Statement of specific search words, synonyms, related subject phrases, narrower terms, broader terms, author names, journal titles, author affiliations
Thesauri, glossaries, handbooks, indexes and titles in abstract journals
Truncation of terms
Terms assembled in conceptual groups, assignment of weights
Manual for profile construction
Specification of search strategy in search logic
Profile input from teletype
Manual for profile input
No
Profile accepted
Yes
Profile
Profile master file
Search
References
ISI Source Tape
MechEn
Chemical Abstracts Condensates
INSPEC
Metals Abstracts Index
Governments Reports Announcements
COMPENDEX
Nuclear Science Abstracts
Abstract Bulletin of the Institute of Paper Chemistry
WOOD
Food Science and Technology Abstracts
ERIC Master Files
Scientific and Technical Aerospace Reports
International Aerospace Abstracts
Subscriber evaluates profile and references
No
Subscriber satisfied
Yes

Z. Gluchowicz

The system used at the RIT Library is based on searching free-text and the documentalist is thus not bound to use a controlled or special vocabulary, but can use any glossary, handbook or dictionary he might find helpful or relevant to describe the query.

In controlled vocabulary systems the terms are restricted to those found in a special glossary or thesaurus compiled for the system.

The documentalist constructs the search profile by selecting search terms from thesauri, dictionaries of synonyms, subject dictionaries, handbooks or other sources relevant to the query. Fig. 3.

In thesauri are found synonyms, general definitions, specific definitions, related terms, RT, broader terms, BT, and narrower terms, NT. In the extract below UF stands for "used for". A dash before a term signifies that the term is listed as a general term to which there are further specific terms.

Ex. If we want to cover the query "Corrosion Prevention of Steel Alloys" we find in Thesaurus of Engineering and Scientific Terms the following terms listed under "Alloy Steels":

Alloy steels
  UF Steel alloys
  BT Iron alloys
     Steels
  NT Abrasion resistant steels
     Austentic stainless steels
     Boron intensified steels
     Chromium molybdenum steels
     Chromium steels
     Chromium vanadium steels
     Copper steels
     Corrosion resistant steels
     Die steels
     Electrical steels
     Ferritic stainless steels
    -Free machining steels
     Heat resistant steels
    -High alloy steels
     Leaded steels
    -Low alloy steels
     Manganese steels
     Maraging steels
     Martensitic stainless steels
     Molybdenum steels
     Nickel chromium molybdenum steels
     Nickel chromium steels
     Nickel cobalt steels
     Nickel molybdenum steels
     Nickel steels

The following terms are listed in the same thesaurus under Corrosion Prevention:

Corrosion prevention
  UF Corrosion control
     Corrosion protection
  NT Anodic protection
     Cathodic protection
     Impressed current protection
     Rust prevention
  RT Aeration
    -Chemical finishing
    -Cleaning
    -Coating processes
    -Coatings
     Corrosion environments
     Corrosion inhibitors
    -Corrosion resistance
     Deaeration
     Desensitizing
     Desiccants
     Inhibition
    -Inhibitors
     Metal Protection
    -Packaging
     Passivity
     PH control
     Preserving
     Protection
     Sensitizing
    -Sewage treatment
    -Water treatment
     Weatherproofing

As the search is performed by matching the contents on the tapes with the search terms in the search profiles, all variations in spelling have to be considered, e.g. the difference in American and British spelling (gaging, gauging) and the variations in the transcription of Slavic names (Meščerjakov, Meshcheryakov).

Both letters and numbers are searched in the search procedure. All other signs, e.g. the hyphen, are considered as blanks. In order to get as many relevant references as possible the list of search terms in the search profile has to be fairly exhaustive.

The profile concordance.

New profiles often have several words and concepts in common with old profiles. In order to facilitate the construction of new profiles and to be able to benefit on the intellectual effort and work done on old profiles and the experience gained about terms suitable for different queries, the documentalists have designed a concordance of search terms and search profiles. This profile concordance is an important aid in the construction of profiles and is kept up-to-date.

The profile concordance consists of three parts:

Part 1 contains an alphabetic list of search terms where to each term is associated a list of the profiles and the sets within the profiles that use the term in question.

Part 2 is an index of search terms, listed in profile and set sequence. As all sets are listed with all terms which belong to that set, it gives a complete display of the search terms for any profile. For any search term found in Part 1 all the terms belonging to the same set or the same profile can be found in Part 2.

Part 3 is an alphabetic thesaurus of truncated and not truncated terms. The terms are listed in three groups: right-truncated, left-truncated and both right and left truncated terms.

Example from the profile concordance. Part 1.

Search term	Profile	Set	Profile	Set	Profile	Set	Profile	Set
STEEL	A05	C	A06	J	A42	B	A46	D
	M12	B	M17	C	01H	D	046	M
	123	K	13D	B	13Q	B	13X	B
	32B	A	32N	C	32P	E	32P	J
	43A	C	432	B	432	B	44D	C
	52R	A	53D	B	53E	A	54E	B
	652	C	66R	A	67P	C	67P	F
	73F	E	73Q	B	73Y	B	74F	A
	92B	E	92D	B	92G	C	93E	B
STEEL BACKED BEARI	32R	D						
STEEL INDUSTR	82E	C						
STEEL MAKING	32N	A	82E	A				
STEEL PLANT	82E	C						
STEEL WIRE	07T	J	22H	J				
STEELMAKING	32N	A	82E	A				

Example from the profile concordance. Part 2.

Profile	Set	Term	Term	Term
32M	H	B46	B48	C755
32N	A	METALLURG	STEEL MAKING	STEELMAKING
32N	B	ONLINE	AUTOMATI	CONTROL
			OPTIM	DIGITAL
			IDENTIFICATION	MODEL
32N	C	STRIP	SLAB	ROLL
32N	D	MILL		
32N	E	HOT	COLD	TANDEM
32P	A	EPSTEIN	CORE LOSS	GOSS
32P	B	RECRYSTALLIZ		
32P	C	SECOND	TERTIAR	
32P	D	SILICO	SI	
32P	E	IRON	FE	STEEL
32P	F	CUBE		
32P	G	TEXTUR	EDGE	FACE
32P	H	ORIENT		
32P	I	CUB	DOUB	GRAIN
32P	J	STEEL	SHEET	LAMINAT
32P	K	TRANSFORMER	ELECTRICAL	ELECTROTECH
32Q	A	WELD		

Truncation.

When a search term in a profile is not truncated it will be retrieved only if it matches exactly with the same term in the data base.

Terms may be truncated to facilitate retrieval of terms with a common root or containing common fragments. Incorporating a truncation device makes it possible to search for a portion of a term only.

There are three truncation facilities allowed in our system: at the beginning of the term - left truncation, at the end of the term - right truncation and simultaneous left and right truncation. By left truncation the term will be retrieved with substitution of any prefix. By right truncation the term will be retrieved with any suffix. Simultaneous left and right truncation allows simultaneous substitution of prefix and suffix on a term fragment or term root.

Truncation makes it possible to retrieve references with singular or plural forms, different tenses of a verb, or other flexions.

The usefulness of simultaneous left and right truncation can be illustrated by the following example. When a user is interested in polymers in some specified correlations, the truncated term *POLYMER* where the * indicates truncation will retrieve POLYMERS, POLYMERIZATION, COPOLYMERS etc. The truncation device is a very helpful tool that gives the user great facilities to search for word stems as the nature of the query dictates.

When truncating the searcher must be careful not to use letter groupings or term fragments that occur in frequent and unrelated terms as they might result in a great number of irrelevant hits thus giving low precision.

A splendid illustration of such unforeseen hits is given by the simultaneous left and right truncated term *ION*. The searcher's intention by this truncation was to retrieve all references containing the word fragment ION as IONS, ANIONS etc. The recall was enormous taking into consideration all the words with the suffix -tion, -sion, etc.

Search logic.

Terms being definitions of the same aspect, process, function or concept in a query are combined into groups - sets. The search profile describes the query by linking together groups of terms by means of a logic expression.

The new profiling program permits the use of both logical and arithmetical operators in the search logic. The arithmetical operators + , * and - are now the ones most commonly used by the SDI service of the RIT.

The addition operator (+) for the logical sum meaning "OR" is applied when the query can be described by a number of alternative terms and/or groups of terms. In this case the condition for retrieval of a reference is that it should contain one or another or several terms out of a certain group of terms. In order to retrieve articles with titles containing "alloy steels" or "corrosion prevention" the profile has to be written in the following way:

```
LOGIC: A

GROUP  NO  TERM
  A    01  ALLOY STEELS
  A    02  CORROSION PREVENTION
```

In this example the search logic contains only the group name - the letter A. For such a profile all references containing "alloy steels" or "corrosion prevention" or both phrases will be retrieved by the computer.

A group - set - in a profile can consist of one or more search terms. Instead of writing A1 + A2 in order to express that references containing one of the terms or both are wanted we use A. This group name will then represent the operator for the logical sum. The same example can be expressed in a different way:

```
LOGIC: A + B

GROUP  NO  TERM
  A    01  ALLOY STEELS
  B    01  CORROSION PREVENTION
```

The search output will be the same in both cases. The choice between these two methods depends on the other terms and/or groups of terms contained in the profile.

The multiplication operator (*) for the logical product or intersection is being used in cases where a user describes his field of interest by a condition requiring that references containing at least one term from one group and at the same time at least one term from another group should be retrieved.

If all references of articles containing "alloy steels" and simultaneously "corrosion prevention" are wanted, this will be expressed in the following way:

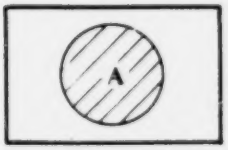
```
LOGIC: A * B

GROUP  NO  TERM
  A    01  ALLOY STEELS
  B    01  CORROSION PREVENTION
```

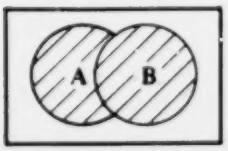
All references containing term A and term B at the same time will be retrieved by the computer.

The subtraction operator (-) with the logical meaning "NOT", the negationoperator is being applied in cases where we wish the

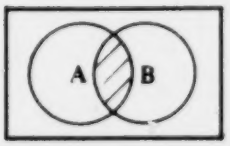
Fig. 4. Examples of search strategies.



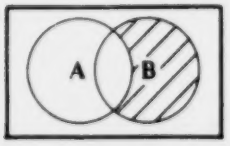
A ---------- A reference will be retrieved if any one term from within a group nominated A appears in the reference.



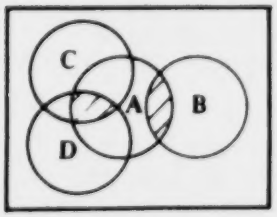
A+B -------- A reference will be retrieved if any one term from within a group nominated A or any one term from within a group nominated B appears in the reference.



A*B -------- A reference will be retrieved if any one term from within a group nominated A combined with any one term from within a group nominated B appears in the reference.



B-A ---------- The group nominated A is a NOT-group. A reference will be retrieved if it contains any one term from within a group nominated B, but it will not be retrieved if any one term from within a group nominated A appears in the reference at the same time.



A*(B+C*D) -- A reference will be retrieved if any one term from within a group nominated A combined with any one term from within a group nominated B, or with any one term from each of the groups nominated C or D appear in the reference. This search strategy can also be expressed A*B+A*B*C.

computer to eliminate all references containing a certain term or terms of a negated term group. The negation operator causes all these references to be deleted. Fig. 4.

Weighting of search terms.

Weighting of search terms is not a new idea. (4). By assigning weights to the search terms of a profile the search result will be more accurately specified as the references will be arranged by decreasing weight in the output.

Each search term can be assigned the same weight value; in this case the order of references will only depend on the logical condition being satisfied by the references in question. But a better ordering of the output can be attained by using a diversified weighting. The references in the output are sorted according to rank in a decreasing order. The rank is calculated by applying the arithmetical operators to the weights of the search terms in the reference. If in a profile each search term has the weight 3, the rank of each retrieved reference will depend on the logical condition satisfied by the reference and calculated as follows:

LOGIC	RANK OF REFERENCE
A	3
A + B	3 + 3 = 6
A * B	3 * 3 = 9
A * B + C	3 * 3 + 3 = 12
A * B * C	3 * 3 * 3 = 27

Only references with a rank exceeding zero will be retrieved.

If the profile contains a negated group marked T with search terms having the weight 98 and the search logic for this profile is A * B - T then a reference containing a term included in group T will have the rank 3 * 3 - 98 = -87. The rank being negative this reference will not be retrieved.

Alternative profiles.

In order to maintain effective coverage most queries have to be run against two or three data bases. The user and the subject specialist decide in cooperation on which data bases the query is to be searched. The program systems ABACUS and VIRA can be used for processing any data base, so that profiles can be constructed for ABACUS or for VIRA in a general manner and be used for search on any data base.

As there is no standard for data bases, different data bases contain different bibliographic items. In order to be able to search different items as classification codes, descriptors, etc, or to restrict searches to certain classes of documents or subject fields of a data base these details have to be specified in the profile. Therefore, primarily, a basic profile will be formulated, i.e. a profile common for all data bases against which the query is to be run. The basic profile, which is

formulated for title search only, will then be copied by the profiling program and augmented by the specific search elements contained in the data base to be searched. Accordingly a query can be formulated in several alternative profiles to be searched on different data bases.

Profile SDI2B is an example of a profile to be searched against the ISI tape. The alternative profile for the same query, being searched against the INSPEC tape, is shown in example SDI2F. Here the basic profile (in this case the ISI-profile) has been augmented by the subject category codes contained on the INSPEC tape.

The complete profile is written on a punch form and then punched on cards or fed to the computer through a teletype input/output unit. The profile will be received by the computer and stored on a disc or some other storage unit. The user first gets a profile print-out and later the first search result, i.e. the search output.

NAME : SDI1C PAGE 01
DATA BASE : MECHEN VERSION : 002

RANK : 90 MODIFICATION DATE : 06/03/73
MAX. REFS : 0100 CREATION DATE : 26/02/73

COMMENTS : SLIPMASKINER LAGER

LOGIC : A +E*(B +C*D) +F*G

	GROUP	NO	TYPE	WEIGHT	CUM	TERM
	A	01	TITL	+02		* CYLINDRICAL GRIND*
*	A	02	TITL	+20		* INTERNAL GRIND*
	A	03	TITL	+02		* GRINDING MACHIN*
	A	04	TITL	+02		* SIZE CONTROL*
*	B	01	TITL	+06		* BALL*
*	B	02	TITL	+08		* HYDROSTATIC*
	B	03	TITL	+02		* AIR*
	B	04	TITL	+02		* GAS*
	B	05	TITL	+02		* FLUID*
	C	01	TITL	+02		* HIGH*
	D	01	TITL	+02		* SPEED*
	E	01	TITL	+02		*BEARING*
	F	01	TITL	+02		* GAGE*
	F	02	TITL	+02		* GAGING*
	F	03	TITL	+02		* GAUG*
	F	04	TITL	+02		* GRINDING*
*	G	01	TITL	+04		* IN PROCESS*
	G	02	TITL	+02		* AIR *

TOTAL NO. OF TERMS : 0018

Comments on the profile print-out SDI1C.

NAME: Profile name, representing the profile in the search and in all administrative routines.

DATA BASE: Is to notify that this alternative profile is to t searched on the MechEn tape, the data base produced by the RIT Library.

VERSION: This figure indicates wether this is a new profile or an updating of an older profile. A new profile is marked by VERSION: 001. For every updating a new profile print-out with a new version number will be produced. VERSION: 002 means that the profile has been updated once. The asterisks in front of the search terms A 02, B 01, B 02, and G 01 indicate where changes have taken place.

RANK: This information is for internal use.

MAX. REFS: The maximum number of references to be printed.

MODIFICATION DATE: The date of updating the profile.

CREATION DATE: The date of formulating the profile.

COMMENTS: The title of the query.

According to the search strategy expressed by the LOGIC, references satisfying at least one of the following conditions should be printed out:

1: Condition A: The reference must contain at least one term out of group A i. e. CYLINDRICAL GRIND* or INTERNAL GRIND* or GRINDING MACHIN* or SIZE CONTROL*. The asterisks after GRIND*, MACHIN* and CONTROL* mean that these terms are truncated and will be picked up by the computer also if they have a suffix, e.g. grinding, machines.

2: Condition E * B: The reference must contain at least one term out of group E (i.e. *BEARING*) and at the same time at least one term out of group B. Notice that *BEARING* is left and right truncated so neither a prefix nora suffix will stop the retrieval of the reference.

3: Condition E * C * D: The reference must contain at least one term of each of the groups E, C, and D simultaneously.

4: Condition F * G: The reference has to contain at least one term out of group F and at least on term out of group G at the same time.

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LITTERATURLISTA

Sökprofil SDI1C
Datum 73/03/02
Databas MECHEN

Antal ref 22

NEW PLANT EQUIPMENT. BRITISH INTERNAL GRINDING MACHINE OFFERS HYDROSTATIC BEARINGS FOR HIGHER ACCURACY. MILL HAS LARGE CAPACITY FOR ITS MEDIUM SIZE. 1 C
ANONYMOUS
AMERICAN MACHINIST. 117 -73 NO 1 N P64
VIKT=38.00 * INTERNAL GRIND* GRINDING MACHIN* HYDROSTATIC* *BEARING*

MACHINE TOOL DESIGN. DESIGN OF HYDROSTATIC JOURNAL BEARINGS UNDER IMPULSIVE LOADS. POSSIBLE APPLICATION OF HYDROSTATIC SYSTEMS TO MACHINETOOLS PARTS... 2 C
FAVARETO M RAZELLO G
ADVANCES IN MACHINE TOOL DESIGN AND RESEARCH. A. -72 SEPTEMBER P299-316 14R
VIKT=16.00 *BEARING* HYDROSTATIC*

BALL BEARING PACT BREACH ALERTS DTI. 3 C
ANONYMOUS
ENGINEER. 236 -73 NO 6098 P11
VIKT=12.00 *BEARING* BALL*

IN-PROCESS GAUGING GO HORIZONTAL. 4 C
ANONYMOUS
ENGINEER. 236 -73 NO 6099 N P18
VIKT=8.00 * IN PROCESS* GAUG*

3 AMP RELAY. SEQUENTIAL AIR GAGES. CONVERTER CHARGER. 5 C
ANONYMOUS
APPLIANCE. 29 -72 NO 12 N P68
VIKT=4.00 * AIR * GAGE*

DEFORMATION OF A CYLINDRICAL GRINDER CAUSED BY IRREGULAR WORK-ROTATION. 6 C
BONDAR MP MIKHAILETS PM
MACHINES AND TOOLING. 43 -72 NO 7 P22-23
VIKT=2.00 * CYLINDRICAL GRIND*

DYNAMIC SIZE CONTROL IN AN EXTRUSION LINE. 7 C
PATON
WIRE INDUSTRY. 39 -72 NO 468 P992-994
VIKT=2.00 * SIZE CONTROL*

Comments on the list of references - output for the profile SDI1C.

This list of references is the result of a search of a MechEn tape by the profile SDI1C.

Each reference contains the title, author (in the first reference he is anonymous), and information on where the reference has been found - the source publication. In this case the reference originates from the journal American Machinist, Vol 117(1973): no. 1.

The letter N indicates that the reference is a notice found on page 64. The last line of the reference indicates the rank and the search terms causing the retrieval of the reference.

The search term INTERNAL GRIND* belongs to group A and has the weight 20. (See the profile print-out). GRINDING MACHIN* also belongs to group A and has the weight 2. HYDROSTATIC* belongs to group B and has the weight 8. *BEARING* is in group E and has the weight 2. The reference satisfies the following condition: A + E * B and thus the rank of the reference is calculated: 20 + 2 + 2*8 = 38

The references in the output are numbered and each number is followed by a letter indicating the data base. This detail distinguishes outputs with the same date. Orders for copies can be carried out quicker when this letter is stated together with the reference number on the forms for ordering and evaluation.

The data bases are marked by the following letters:

A ISI	J NSA
B ISIR	K TR
C MechEn	L ABIPC
D CAC ODD	M ERIC
E CAC EVEN	N FSTA
F INSPEC	P WOOD
G Metadex	Q GRA
H COMPENDEX	R AKN NAT
	T CP

```
NAME       : SDI2B                                        PAGE 01
DATA BASE  : ISIR                  VERSION : 002

RANK       : 90                    MODIFICATION DATE : 18/01/73
MAX. REFS  : 0100                  CREATION DATE     : 22/11/72

COMMENTS   : SYNTES AV ELEKTRONISKA KRETSAR/SYSTEM

LOGIC      : A +B*(C +D +E) +C*(E +F +G +H +K +L +M) +
             E*(K +M) +G*N +L*H -S

GROUP NO TYPE WEIGHT CUM   TERM

  A   01 TITL   +02       * AUTOMATA THEORY*
  A   02 TITL   +02       * COMPUTER DESIGN*
  A   03 TITL   +02       * DIGITAL SYSTEM*
  A   04 TITL   +06       * LOGIC SYSTEM*
  A   05 TITL   +02       * MACHINE LOGIC*
  A   06 TITL   +06       * SEQUENTIAL MACHINE*
  A   07 TITL   +02       * SYNCHRONOUS SYSTEM*

* B   01 TITL   +06       * NETWORK*

  C   01 TITL   +06       * LOGIC*

  D   01 TITL   +02       * DIGITAL*

  E   01 TITL   +02       * SEQUENTIAL*

  F   01 TITL   +02       * ALGORITHM*
  F   02 TITL   +02       * AUTOMAT*
  F   03 TITL   +02       * COMBINAT*
  F   04 TITL   +02       * PARTITION*

  G   01 TITL   +02       * FUNCTION*

  H   01 TITL   +02       * SIMULAT*

  K   01 TITL   +02       * SYNTHESIS*

  L   01 TITL   +02       * LANGUAGE*

  M   01 TITL   +02       * DESIGN*

  N   01 TITL   +02       * MULTIPLE OUTPUT*
  N   02 TITL   +02       * MULTI VALUE*

  S   01 TITL   +98       * FILTER*

TOTAL NO. OF TERMS : 0023
```

NAME : SDI2F PAGE 01
DATA BASE : INSPEC VERSION : 002

RANK : 90 MODIFICATION DATE : 22/03/73
MAX. REFS : 0100 CREATION DATE : 22/11/72

COMMENTS : SYNTES AV ELEKTRONISKA KRETSAR/SYSTEM

* LOGIC : A +B*(C +D +E) +C*(E +F +G +H +K +L +M) +
E*(K +M) +L*H +G*N +P*(H +R +B*K) -S

GROUP	NO	TYPE	WEIGHT	CUM	TERM
A	01	TITL	+02		* AUTOMATA THEORY*
A	02	TITL	+02		* COMPUTER DESIGN*
A	03	TITL	+02		* DIGITAL SYSTEM*
A	04	TITL	+02		* MACHINE LOGIC*
A	05	TITL	+06		* LOGIC SYSTEM*
A	06	TITL	+06		* SEQUENTIAL MACHINE*
A	07	TITL	+02		* SYNCHRONOUS SYSTEM*
B	01	TITL	+06		* NETWORK*
C	01	TITL	+06		* LOGIC*
D	01	TITL	+02		* DIGITAL*
E	01	TITL	+02		* SEQUENTIAL*
F	01	TITL	+02		* ALGORITHM*
F	02	TITL	+02		* AUTOMAT*
F	03	TITL	+02		* COMBINAT*
F	04	TITL	+02		* PARTITION*
G	01	TITL	+02		* FUNCTION*
H	01	TITL	+02		* SIMULAT*
K	01	TITL	+02		* SYNTHESIS*
L	01	TITL	+02		* LANGUAGE*
M	01	TITL	+02		* DESIGN*
N	01	TITL	+02		* MULTIPLE OUTPUT*
N	02	TITL	+02		* MULTI-VALUE*
P	01	KEY	+02		* B16*
P	02	KEY	+02		* B187*
P	03	KEY	+02		* C91*
P	04	KEY	+02		* C92*
P	05	KEY	+02		* C94*
R	01	TITL	+02		* NAND *

CONTINUED

NAME : SDI2F PAGE 02
DATA BASE : INSPEC VERSION : 002

GROUP	NO	TYPE	WEIGHT	CUM	TERM
R	02	TITL	+02		* NOR *
R	03	TITL	+02		* FLIPFLOP*
R	04	TITL	+02		* FLIP FLOP*
R	05	TITL	+02		* MINIMI*
S	01	TITL	+98		* FILTER*

TOTAL NO. OF TERMS : 0033

Comments on the profile print-outs SDI2B and SDI2F.

Profile SDI2B is a profile for search on the ISI tape. Profile SDI2F is the alternative profile of the same query for search on the INSPEC tape. This profile has been augmented by a group of terms that are classification codes:

```
P   01  KEY     +02     * B16*
P   02  KEY     +02     * B187*
P   03  KEY     +02     * C91*
P   04  KEY     +02     * C92*
P   05  KEY     +02     * C94*
```

The letter "B" in front of the code indicates that this subject category belongs to the Electrical and Electronics Abstracts part of INSPEC. The letter "C" preceding the code indicates that this classification code designates a subject category in the Computer & Control part of INSPEC.

For translation of the classification codes to subject fields, see the following excerpt:

Excerpt from the INSPEC classification:

1.600 CIRCUIT THEORY
1.610 Network topology
1.620 General analysis and synthesis methods
1.630 Computer-aided circuit analysis and design
1.640 Lumped linear networks
1.650 Distributed linear networks
1.660 Nonlinear network analysis and design
1.670 Time-varying and switched networks

1.800 ELECTRONIC CIRCUITS
1.810 Parametric microwave circuits
1.820 Solid-state microwave circuits
1.830 Power electronics, supply and supervisory circuits
1.840 Amplifiers
1.850 Oscillators
1.860 Modulators and demodulators, discriminators and mixers
1.870 Pulse and digital circuits
1.880 Filters and other networks
1.890 Special purpose electronic circuits

9.000 COMPUTER SYSTEMS AND EQUIPMENT
9.100 COMPUTER METATHEORY AND SWITCHING THEORY
9.120 Formal logic
9.140 Automata theory
9.160 Switching theory
9.162 Combinatorial switching theory
9.164 Sequential switching theory
9.190 Other computer theory

9.200 LOGIC ELEMENTS AND CIRCUITS

9.220 Semiconductor logic elements
9.240 Other logic elements
9.260 Logic and switching circuits
9.290 Other circuits for digital computers

9.400 LOGIC-DESIGN AND DIGITAL TECHNIQUES

9.420 Logic design methods
9.440 Computer-aided logic design
9.460 Computer architecture
9.480 Digital arithmetic methods

According to one of the conditions expressed in the search logic references within the subject fields classified by the codes listed in group P shall be retrieved only if the title of the reference contains at least one term out of group H or group R or at least one term of each of the groups B and K:

P * (H + R + B * K)

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LITTERATURLISTA

Sökprofil SDI2B
Datum 73/01/24
Databas ISIR

Antal ref 3

STRATIFICATION THEOREM FOR GENERALIZED FUNCTIONALITY IN COMBINATORY LOGIC 1 B
SELDIN JP
J SYMB LOG VOL 42 1972 N 2 P 431 R 002 M
VIKT-24.00 * LOGIC* COMBINAT* FUNCTION*

SIMPLIFICATION OF COMBINATORY LOGIC 2 B
GOODMAN ND
J SYMB LOG VOL 37 1972 N 2 P 225 R 004
VIKT-12.00 * LOGIC* COMBINAT*

RS)) LAPLACE-GALOIS MULTIDIMENSIONAL TRANSFORMATION IN THEORY OF NONLINEAR SEQUENTIAL MACHINES 3 B
BERNSHTE.AS FARADZHE.RG POPKOV YS
DAN SSSR VOL 206 1972 N 5 P 1061 R 002
VIKT-6.00 * SEQUENTIAL MACHINE* SEQUENTIAL*

postadress 100 44 Stockholm
telefon 08-23 65 20
telex 103 89 KTHB Stockholm

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LITTERATURLISTA

Sökprofil SDI2F
Datum 73/02/16
Databas INSPEC

Antal ref 27

AUTOMATIC AXHAUSTIVE TESTING AND DIAGNOSTICS OF SEQUENTIAL LOGIC NETWORKS. 1 F
JAIN, G.C. ADSHEAD, H.G.
DIGESTS OF PAPERS FROM THE 1972 INTERNATIONAL SYMPOSIUM ON FAULT-TOLERANT COMPUTING. NEWTON, MASS., USA 19-21 JUN 1972 P. 73-8
VIKT=72.00 * NETWORK* LOGIC* SEQUENTIAL* AUTOMAT* C94*

ACTIVE NETWORK SYNTHESIS USING THE GENERALIZED POSITIVE IMPEDANCE CONVERTER 2 F
COBB, D.R.
161 PP.
VIKT=24.00 * NETWORK* SYNTHESIS* B16*

DESIGN OF SELF CHECKING DIGITAL NETWORKS USING CODING TECHNIQUES 3 F
ANDERSON, D.A.
R-527DAA807-67-C-0199 AD-735677 SEPT. 1971 140 PP.
VIKT=12.00 * NETWORK* DIGITAL* DESIGN*

DESIGNING TESTABILITY INTO COMPLEX LOGIC BOARDS 4 F
BOSWELL, F.R.
ELECTRONICS (USA) VOL.45, NO.17 116-19 14 AUG. 1972
VIKT=12.00 * LOGIC* DESIGN* B16* C94* B187*

A COMPUTER PROGRAM FOR MINIMIZING BOOLEAN FUNCTIONS 5 F
MACKAY, R. WEIHMANN, K
ELEKTRONIK (GERMANY) VOL.21, NO.8 267-9 AUG. 1972 1 R
GERMAN
VIKT=8.00 * FUNCTION* C91* C94* MINIMI*

J-K FLIP-FLOP 6 F
PHILIPS ELECTRON. & ASSOC. IND. LTD.
PATENT UK 1262128 3 APRIL 1969
VIKT=8.00 * C92* B187* FLIP FLOP*

TOWARD AN AUTOMATA THEORY OF BRAINS 7 F
ARBIB, M.A.
COMMUN. ACM (USA) VOL. 15, NO. 7 521-27 JULY 1972 15 R
VIKT=2.00 * AUTOMATA THEORY* AUTOMAT* C90*

Comments on the list of references for the profile SDI2F.

Reference 1F refers to a lecture held at a symposium. The search terms causing the retrieval of the reference have the following weights and group designations in the profile:

TERM	WEIGHT	GROUP
NETWORK	+06	B
LOGIC	+06	C
SEQUENTIAL	+02	E
AUTOMAT	+02	F
C94	+02	P

The reference satisfies the following logical condition:

B * (C + E) + C * (E + F)

In accordance with this the rank of the reference is calculated by substituting the weights of the terms:

6 * (6 + 2) + 6 * (2 + 2) = 48 + 24 = 72

The classification code C94 has not affected the rank of this reference, as it has to appear together with a term out of group H or R or with one term out of each of the groups B and K. This condition is not satisfied by this reference. Thus C94 has not influenced the retrieval of this reference, but as it appears in the profile and in the reference it has been recorded by the computer.

Reference 2F refers to a thesis.

Reference 3F refers to a research report.

Reference 4F and 5F refer to articles in journals.

Reference 6F is the title of a patent. The name of the inventor is not stated but the institution patenting the invention is specified.

NAME : SDI3H PAGE 01
DATA BASE : COMPX VERSION : 001

* RANK : 90 MODIFICATION DATE : 22/11/72
* MAX. REFS : 0100 CREATION DATE : 22/11/72

* COMMENTS : CHEMICAL PROCESSES. BOILER FIRING.

* LOGIC : A +B*C +D*E +F*G

	GROUP	NO	TYPE	WEIGHT	CUM	TERM
*	A	01	TITL	+04		* ATOMISER*
*	A	02	TITL	+04		* ATOMIZER*
*	A	03	KEY	+04		* BOILER FIRING *
*	A	04	KEY	+04		* CUPOLAS *
*	A	05	KEY	+04		* FURNACES, INDUSTRIAL*
*	A	06	KEY	+04		* GAS BURNERS *
*	A	07	KEY	+04		* OIL BURNERS *
*	A	08	TITL	+04		* OIL BURNER*
*	B	01	TITL	+02		* GAS*
*	C	01	TITL	+02		* BURNER*
*	D	01	KEY	+02		* BOILER CONTROL *
*	D	02	KEY	+02		* GASES *
*	E	01	KEY	+02		* COMBUSTION *
*	F	01	KEY	+02		* BOILERS *
*	G	01	KEY	+02		* WASTE HEAT *

TOTAL NO. OF TERMS : 0015

NAME : SDI3E
DATA BASE : CACEVN VERSION : 003 PAGE 01

RANK : 90
MAX. REFS : 0100 MODIFICATION DATE : 14/02/73
CREATION DATE : 19/11/72

COMMENTS : CHEMICAL PROCESSES. BOILER FIRING.

LOGIC : A +B*(C +E) +D*(E +F)

	GROUP	NO	TYPE	WEIGHT	CUM	TERM
*	A	01	TITL	+05		* ATOMISER*
*	A	02	TITL	+05		* ATOMIZER*
*	A	03	TITL	+05		* GAS BURNER*
	A	04	TITL	+02		* INDUSTRIAL FURNACE*
*	A	05	TITL	+05		* OIL BURNER*
	B	01	TITL	+02		* GAS*
	B	02	TITL	+02		* OIL*
	C	01	TITL	+02		* BURNER*
	D	01	TITL	+03		* BOILER*
	E	01	TITL	+03		* COMBUST*
	E	02	TITL	+03		* FIRING*
	F	01	TITL	+03		* WASTE HEAT*

TOTAL NO. OF TERMS : 0012

Comments on the profile print-outs SDI3H and SDI3E.

Profile SDI3H is a profile to be searched on the COMPENDEX tapes. In this profile some of the search terms are "SUBJECT HEADINGS" as they appear in the Engineering Index. In this case the condition for retrieval states that a reference has to belong to one of the subject fields stated in group A or to a field being the intersection of two specified subject fields: D * E + F * G.

This is a new profile therefore the "CREATION DATE" and the "MODIFICATION DATE" are identical on this print-out. As all search terms are new, there is an asterisk in front of each of them. In a modified profile only the altered search terms are marked by an asterisk.

Profile SDI3E is an alternative profile to be searched on CAC - Chemical Abstracts Condensates - EVEN.

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LITTERATURLISTA

Sökprofil SDI3H
Datum 73/03/06
Databas COMPENDEX

Antal ref 17

RELAY AND SOLID-STATE BURNER SEQUENCE CONTROL SYSTEMS. 1 H
MURPHY, RAYMOND J. JR. LYON, MARVIN L.
ISA TRANS V 11 N 3 1972 P 233-249 EI 72 12 011170
VIKT=8.00 * OIL BURNERS * GAS BURNERS * BURNER* BOILERS *

BETTER MARKS ON POLLUTION FOR THE SST. 2 H
FERRI, ANTONIO
ASTRONAUT AERONAUT V 10 N 7 JUL 1972 P 37-41
EI 72 12 010703
VIKT=4.00 * GASES * COMBUSTION *

TRIGAS FLUXING 3 H
ADAMO, R. J. BROOKS, C. L.
J MET V 24 N 8 AUG 1972 P 21-24 EI 72 12 010968
VIKT=4.00 * GASES * COMBUSTION *

MATHEMATICAL MODELLING OF A WASTE-HEAT BOILER AS A CHEMICAL REACTOR. 4 H
POTAPCHUK, V. S. KARTSYNEL, M. B.
INT CHEM ENG V 12 N 2 APR 1972 P 254-257
EI 72 12 011243
VIKT=4.00 * BOILERS * WASTE HEAT *

EFFECTS OF FLOW RATE ON THE DISTRIBUTION PATTERN AND DROP-SIZE SPECTRUM OF A SPINNING ATOMIZER. 5 H
BODE, L. H. ZIMMERMAN, T. L. GOERING, C. E.
GEBHARDT, M. R.
TRANS AM SOC AGR ENG, GEN ED V 15 N 1 JAN-FEB 1972 P 86-90
EI 72 12 011272
VIKT=4.00 * ATOMIZER*

SINTERING DOLOMITE AND LIMESTONE AS A FUNCTION OF THEIR INDUSTRIAL PROCESSING AND CALCIUM FLUORIDE ADDITIONS. 6 H
MAMYKIN, P. S. IVANOVA, A. V.
REFRACTORIES V 12 N 9-10 SEP-OCT 1971 P 653-656
EI 72 12 011693
VIKT=4.00 * FURNACES, INDUSTRIAL*

postadress 100 44 Stockholm | telefon 08-23 65 20 | telex 103 89 KTHB Stockholm

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Kungl Tekniska Högskolans Bibliotek
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LITTERATURLISTA

Sökprofil SDI3E
Datum 73/01/11
Databas CAC EVEN

Antal ref 12

KINETICS OF AND PARAMETER ESTIMATION FOR THE TREATMENT STEPS IN THE WASTE-HEAT BOILER AND THE ABSORPTION TOWER OF THE NITRIC ACID PROCESS 1 E
FOURTIN, J. M. H.
ADVAN. CHEM. SER. 109-CHEM. REACT. ENG., INT. SYMP. 1ST (1972) PAGE 545-8 ENG CA077-22-141868
VIKT=9.00 * BOILER* WASTE HEAT*

EFFECTS OF ADDITIVES ON NITRIC OXIDES AND SULFUR DIOXIDE EMISSIONS FROM A SMALL OIL BURNER 2 E
SHEN, THOMAS TO
(1972) PAGE 151 PP. ENG CA077-22-143517
VIKT=9.00 * OIL BURNER* OIL* BURNER*

GAS COMBUSTION 3 E
BRYUKHANOV, O. N. MOROZOV, G. A.
PRIKL. VOP. TEOR. GORENIYA (1971) PAGE 7-30 RUSS CA077-22-142008
VIKT=6.00 * GAS* COMBUST*

IN SITU COMBUSTION IGNITION OF OIL IN SUBTERRANEAN FORMATIONS 4 E
CITIES SERVICE OIL CO.
BANDYOPADHYAY, PRATIP
PAT. 3672450 U.S. (1971-01-28) 5 PP. CA077-22-142079
VIKT=6.00 * OIL* COMBUST*

IMPROVED CHEMICAL METHODS FOR SAMPLING AND ANALYSIS OF GASEOUS POLLUTANTS FROM THE COMBUSTION OF FOSSIL FUELS. III. CARBON MONOXIDE 5 E
DRISCOLL, J. N. BERGER, ABRAHAM WILLIAM
U. S. NAT. TECH. INFORM. SERV., PB REP. NO. 209269, (1971) PAGE 72 PP. ENG CA077-22-143459
VIKT=6.00 * GAS* COMBUST*

DETERMINATION OF VANADIUm IN SILICATE ROCKS WITH THE HGA-70 HEATED GRAPHITE ATOMIZER 6 E
CIONI, R. INNICENTI, F. MAZZUOLI, R.
AT. ABSORPTION NEWSLETT. 11-5 (1972) PAGE 102-3 ENG CA077-22-147218
VIKT=5.00 * ATOMIZER*

Comments on the lists of references SDI3E and SDI3H.

The print-out SDI3E is the result of a search of the CAC - Chemical Abstracts Condensates - tapes.

Reference 1E refers to a lecture held at "The first international symposium on chemical reaction engineering". The papers from this symposium are published in the Advances in Chemistry Series, part 109, 1972. The abstract of the cited lecture is published in the Chemical Abstracts, Vol 77, no. 22, abstract no. 141868.

Reference 2E is an example of a reference to a monograph, in this case a thesis.

Reference 3E refers to a journal article from a Russian journal. "RUSS" means that the original is written in Russian and that at the time when it was abstracted for the Chemical Abstracts there was no English translation available. In the Chemical Abstracts Vol 77, no. 22 there is an abstract of this article in English. The abstract number is 142008.

Reference 4E refers to a patent, specified by the patent number, date and the country having granted the patent, in this case the USA.

Reference 5E refers to a research report specified by the report number 209269. It has been issued by the US National Technical Information Service.

Reference 6E refers to a journal article from an English journal.

The list of references SDI3H is the result of a search on the COMPENDEX tape. The search results for the COMPENDEX tapes are arranged in the same way as the examples explained before. The COMPENDEX print-outs also indicate where to find the reference in the printed version of COMPENDEX, called Engineering Index.

EI 72 12 010703 in the reference 2H means that the abstract of this journal article is published in the Engineering Index 1972 no. 12, abstract number 010703.

NAME : SDI4M PAGE 01
DATA BASE : ERIC VERSION : 004

RANK : 90 MODIFICATION DATE : 08/01/73
MAX. REFS : 0100 CREATION DATA : 13/12/72

COMMENTS : COMPUTER ASSISTED EDUCATION

LOGIC : A*(E +G +J) +B +C*(E +F +J +I*G) +
D*(E +G) +E*H

	GROUP	NO	TYPE	WEIGHT	CUM	TERM
	A	01	TITL	+02		* AUTOMAT*
	B	01	TITL	+02		* AUTOINSTRUCT*
	B	02	TITL	+02		* CAI *
	B	03	TITL	+02		* C.A.I. *
	B	04	KEY	+02		* AUTOINSTRUCTIONAL AIDS*
	B	05	KEY	+02		* AUTOINSTRUCTIONAL PROGRAMS*
	B	06	KEY	+02		* COMPUTER ASSISTED INSTRUCTION*
	B	07	KEY	+02		* PROGRAMED INSTRUCTION*
	B	08	KEY	+02		* AUTOINSTRUCTIONAL METHODS*
	B	09	KEY	+02		* AUTOMATION*
	B	10	KEY	+02		* TUTORIAL PROGRAMS*
	B	11	KEY	+02		* PROGRAMED MATERIALS*
	B	12	KEY	+02		* PROGRAMED INSTRUCTION TUTORING*
	B	13	KEY	+02		* TEACHING MACHINES*
	B	14	KEY	+02		* TUTORING*
	B	15	KEY	+02		* INDIVIDUAL INSTRUCTION*
	B	16	KEY	+02		* EDUCATIONAL TECHNOLOGY*
	C	01	TITL	+02		*COMPUT*
*	D	01	TITL	+02	C	* PROGRAM*
*	D	02	TITL	-02	C	* PROGRAM *
*	D	03	TITL	-02	C	* PROGRAMS *
*	D	04	TITL	-02	C	* PROGRAMMES *
	E	01	TITL	+02		* EDUCAT*
	E	02	TITL	+02		* LEARN*
	E	03	TITL	+02		* TEACH*
	F	01	TITL	+02		* SCHOOL*
	F	02	TITL	+02		* STUDENT*
	F	03	TITL	+02		* TRAIN*
	G	01	TITL	+02		* INSTRUCT*
	H	01	TITL	+02		* DEVICE*
	H	02	TITL	+02		* MACHINE*
	H	03	TITL	+02		* MEDIA*
	H	04	TITL	+02		* TECHN*
	H	05	TITL	+02		* SIMULAT*
	H	06	TITL	+02		* INDIVIDUAL*

CONTINUED

NAME : SDI4M PAGE 02
DATA BASE : ERIC VERSION : 004

GROUP	NO	TYPE	WEIGHT	CUM	TERM
I	01	TITL	+02		* AID*
I	02	TITL	+02		* ASSIST*
J	01	TITL	+02		* TUTOR*

TOTAL NO. OF TERMS : 0038

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NAME       : SDI4A                                        PAGE 01
DATA BASE  : ISI                    VERSION : 003

RANK       : 90                     MODIFICATION DATE : 08/01/73
MAX. REFS  : 0100                   CREATION DATE     : 08/11/72

COMMENTS   : COMPUTER ASSISTED EDUCATION

LOGIC      : A*(E +G +J) +B +C*(E +F +J +I*G) +
             D*(E +G) +E*H

GROUP NO TYPE WEIGHT CUM   TERM

  A   01 TITL   +02        * AUTOMAT*

  B   01 TITL   +02        * AUTOINSTRUCT*
  B   02 TITL   +02        * CAI *
  B   03 TITL   +02        * C.A.I. *

  C   01 TITL   +02        *COMPUT*

* D   01 TITL   +02   C    * PROGRAM*
* D   02 TITL   -02   C    * PROGRAM *
* D   03 TITL   -02   C    * PROGRAMS *
* D   04 TITL   -02   C    * PROGRAMMES *

  E   01 TITL   +02        * EDUCAT*
  E   02 TITL   +02        * LEARN*
  E   03 TITL   +02        * TRAIN*

  F   01 TITL   +02        * SCHOOL*
  F   02 TITL   +02        * STUDENT*
  F   03 TITL   +02        * TRAIN*

  G   01 TITL   +02        * INSTRUCT*

  H   01 TITL   +02        * DEVICE*
  H   02 TITL   +02        * MACHINE*
  H   03 TITL   +02        * MEDIA*
  H   04 TITL   +02        * TECHN*
  H   05 TITL   +02        * SIMULAT*
  H   06 TITL   +02        * INDIVIDUAL*

  I   01 TITL   +02        * AID*
  I   02 TITL   +02        * ASSIST*

  J   01 TITL   +02        * TUTOR*

TOTAL NO. OF TERMS : 0025
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Comments on the profile print-outs SDI4M and SDI4A.

Profile print-out SDI4M is an alternative profile of the query "Computer assisted education" to be searched on the ERIC tapes. Search terms out of the Thesaurus of ERIC Descriptors (KEY) have been used here. Profiles for all data bases where content designators of this type are available can be formulated this way. Subject headings in COMPENDEX, classification codes in INSPEC and other subject classifications to be used as search terms are designated "KEY" in the profile print-out.

If the same term appears more than once in a reference, its weight is counted only once when calculating the rank of the reference. If the weight is to be counted every time the term appears in the reference, this is indicated by the letter "C" in the column "CUM" (cumulation) next to the weight column as in group D in this profile.

The condition for group "D" means that the reference is to be retrieved if the term D1 PROGRAM* appears in the title in versions such as programming, programmed, programmable, but it is not to be retrieved if the truncated term PROGRAM* appears as D2 PROGRAM, D3 PROGRAMS or D4 PROGRAMMES.

Example: A reference entitled "Examination of a program for new teachers" is first retrieved by the search term D1 and is assigned the weight 2, then by the search term D2 that has the weight -2. The result is +2-2=0 and thus the reference will not be printed out.

In a reference entitled "A program for programmed learning in future" the search term D1 will be retrieved twice, as program and as programmed and will thus have the weight 2+2=4. Term D2 will be retrieved once giving the weight -2. The result is +4-2=+2, therefore the reference will be printed out if the rest of the logical condition D * (E + G) is satisfied. Without cumulation of term D1 the result would have been +2-2=0 and the reference would not have been printed out.

Profile SDI4A is an alternative profile to be searched on the ISI tapes, "C" (cumulation) for terms in group D has been applied in this profile too.

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LITTERATURLISTA

Sökprofil SDI4M
Datum 73/02/06
Databas ERIC

Antal ref 25

CARACTERISTICAS DE LA INSTRUCCION PROGRAMADA COMO TECNICA DE ENSENANZA (CHARACTERISTICS OF PROGRAMED INSTRUCTION AS A TEACHING TECHNIQUE). 1 M
DORREGO, MARIA ELENA
ICOLPE-49-CENDIP-6-VIII-71 24AUG 71 ED064976
VIKT=22.00 * AUTOINSTRUCTIONAL AIDS* PROGRAM* PROGRAM* TEACH* * INSTRUCT* TECHN*

INFORMATION REGARDING TEACHING MACHINES AND PROGRAMMED LEARNING 2 M

72 ED064928
VIKT=20.00 * TEACHING MACHINES* PROGRAMED INSTRUCTION* * PROGRAM* TEACH* LEARN* MACHINE*

THE POTENTIAL OF COMPUTER-ASSISTED INSTRUCTION IN COLLEGE EDUCATION 3 M
BLAINE, DANIEL D.
EDUCATIONAL PERSPECTIVES 11; 2; 16-20 MAY 72 EJ059150
VIKT=14.00 * COMPUTER ASSISTED INSTRUCTION*COMPUT* EDUCAT* * INSTRUCT* ASSIST*

EDUCATIONAL PRODUCTION FUNCTIONS FOR TEACHER-TECHNOLOGY MIXES: PROBLEMS AND POSSIBILITIES. 4 M
ANDERSON, BARRY D. GREENBERG, EDWAR
M-72-2 MAR 72 ED064900
VIKT=12.00 * EDUCATIONAL TECHNOLOGY* COMPUTER ASSISTED INSTRUCTION* EDUCAT* TEACH* TECHN*

MACHINES THAT TEACH. 5 M
SNIECINSKI, JOZEF
AD-733 806 ED064908
VIKT=10.00 * TEACHING MACHINES* PROGRAMED INSTRUCTION* * COMPUTER ASSISTED INSTRUCTION* TEACH* MACHINE*

CAI-BASIC: A PROGRAM TO TEACH THE PROGRAMMING LANGUAGE BASIC. 6 M
BARRY, THOMAS ANTHONY
AD-733-184 SEP 71 ED064917
VIKT=10.00 * PROGRAMED INSTRUCTION* COMPUTER ASSISTED INSTRUCTION* CAI * PROGRAM* PROGRAM* PROGRAM * TEACH*

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LITTERATURLISTA

Sökprofil SDI4A
Datum 73/02/07
Databas ISI

Antal ref 6

CAI (COMPUTER-AIDED INSTRUCTION) SHORTENS PHYSICIAN LEARNING PROCESS 1 A
MEILING R
COMPUTER AU VOL 21 1972 N 12 P 43 N
VIKT=14.00 * CAI *COMPUT* LEARN* INSTRUCT* AID*

GE)) COMPUTER SCIENCE IN SECONDARY SCHOOL EDUCATION - PROPOSAL OF A CURRICULUM BASED ON EXPERIENCE OF AMERICAN HIGHSCHOOLS 2 A
LAUBSCH JH
ANGEW INFOR VOL 1972 1972 N 11 P 499 R 017
VIKT=8.00 *COMPUT* EDUCAT* SCHOOL*

LEARNING PROBLEM IN NONLINEAR AUTOMATIC SYSTEMS 3 A
BERLIN VG
AUT REMOT R VOL 33 1972 N 6 P 943 R 008
VIKT=4.00 * AUTOMAT* LEARN*

TEACHING TECHNIQUE TO INCREASE TEACHER PRODUCTIVITY 4 A
CONE WF
ENG EDUC VOL 63 1972 N 3 P 180 R 004
VIKT=4.00 * TEACH* TECHN*

DECS NEW SCHOOL COMPUTER SYSTEMS 5 A
SHULMAN A
COMPUTER AU VOL 21 1972 N 12 P 44 N
VIKT=4.00 *COMPUT* SCHOOL*

INTEGRATION OF X-RAY REPORTING INTO COMPUTER-STORED POMR - PROTOTYPE TO STIMULATE SYNERGISM AND ESTABLISH FEEDBACK LOOPS ON MEDICAL-EDUCATION AND MEDICAL-CAR 6 A
DIETRICH PA WEED LL
INV RADIOL VOL 7 1972 N 5 P 427 M
VIKT=4.00 *COMPUT* EDUCAT*

postadress 100 44 Stockholm
telefon 08-23 65 20
telex 103 89 KTHB Stockholm

Comments on the lists of references for the profiles SDI4A and SDI4M.

The print-out for profile SDI4M is the result of a search of an ERIC tape. The letters ED preceding the accession number in the reference indicate that the title refers to a research report and that it emanates from the Research in Education - RIE - part of ERIC which contains references to research reports only.

The letters EJ preceding the accession number in reference 3M indicate that the reference belongs to a part of ERIC called Current Index to Journals in Education - CIJE - containing references to journal articles.

The printout to profile SDI4A is the result of a search of an ISI tape for the same query. Besides journal articles ISI also covers technical notes, meeting transactions etc. If the original is not a journal article this is indicated by a letter below the reference number: (See references 1A, 5A and 6A)

A = abstracts of published items
C = corrections, errata, etc.
D = discussions, conference items
E = editorials, editorial-like items
I = items about individuals (tributes, obituaries etc.)
L = letters, communications, etc.
M = abstracts from meetings
N = technical notes
R = reviews and bibliographies

The number of cited references is also stated. Reference 2A, for example, cites 17 references. 2A is a reference to an article written in German (GE)) at the beginning of the reference).

Evaluation and feed-back.

Together with the first list of references sent to the user is enclosed a form on which the user is asked to evaluate the references according to a six-grade scale. (5)

1. Of immediate interest
2. Of interest, but I already have a copy. (I have read the article.)
3. Of interest, but not for immediate use.
4. Cannot determine interest, because the citation does not provide enough detail.
5. Of no interest, because the material does not correspond to what I have described to the system. Irrelevant.
6. Of no interest, because my field of interest have changed since I described it to the system

The users' evaluations of the references give information about to what extent the search terms or the logic have retrieved relevant or irrelevant information. An active interest and personal contact between the user and the documentalist is of great importance to reach a fast convergence for the modifications of the profiles. The required changes in the profile are discussed in a dialogue between the user and the documentalist and changes are fed to the system with immediate effect using a teletype terminal. This feed-back has proved to be an important phase in the interaction of the user with the SDI system. The profiles are continuously being checked and adjusted on the basis of the evaluations. A researcher's interest is not static during the research. Priority of certain aspects of his subject field or the aim or direction of his research may vary and might require a change in the search profile. The documentalist is informed of the changes at an early stage by the evaluation of the references.

The users' evaluations until 30.6.1969.

During the test period (1967-10-01--1969-06-30), when the SDI service was free of charge, the user was requested to evaluate his references as a service in return. Evaluations of 36,072 references were received. (See the table of the users' evaluations until 30.6.1969)

Table of the users' evaluations until 30.6.1969:

	Number of references	Percentage
1 Of immediate interest	9 080	25.1
2 Of interest, but I already have a copy. (I have read the article)	2 459	6.8
3 Of interest, but not for immediate use.	11 009	30.6
4 Cannot determine interest, because the citation does not provide enough detail	1 306	3.6
5 Of no interest, because the material does not correspond to what I have described to the system. Irrelevant.	11 913	33.0
6 Of no interest, because my field of interest have changed since I described it to the system.	305	0.9
	36 072	100.0

Comments:

1 Of 36,072 evaluated references 9,080 are considered to be of immediate interest. This means that 25 per cent of the received information was within the users' interest fields and was of immediate use.

2 Only 6.8 per cent of the notified references was already known to the user; the remaining references were new. The notified information thus had a high novelty value.

3 30.6 per cent of the notified information was evaluated as of secondary interest, i.e. the references were within the field of interest but were not of immediate use.

When a researcher or an engineer is working on a new project or a new technical process or product he will give higher priority to one aspect of his project during one period than during another period when his work has advanced and given certain results and the direction of his research may have taken on new aspects. It is therefore important that the user have access to those references that at first were not of immediate interest.

Copies are often requested of the documents previously evaluated as of secondary interest.

If we add the percentage for the evaluations under 1 , 2 and 3 we get that (25.1 + 6.8 + 30.6) = 62.4 per cent of the references came within the fields of interest, i.e. they were relevant. This is a high percentage of precision.

4 Only 3.6 per cent of the references could not be evaluated because the title did not give enough information. The evaluations show that the title of the document provides sufficient information in 96.4 per cent of the cases. Those users who want abstracts of the documents on their lists of references can of course get these for a special fee to cover the printout.

5 33 per cent of the notified references fell outside the users' fields of interest and were irrelevant. A mechanical information system with 33 per cent "noise" is regarded as having a low "noise level". A librarian who is retrieving the information manually and scanning the documents can hardly reach a lower "noise level".

6 The field of interest has changed without the user notifying the SDI service. This was the case for only 0.9 per cent of the references.

Conclusion.

These evaluated references were retrieved during the starting period of the SDI service. The data bases then searched could not give sufficient coverage for all the queries.

SDI - an automated system for information retrieval - was new to the users as well as to the documentalists at the RIT Library. In 1969 this SDI system was quite unique. There was no possibility of gaining experience from others. The group of documentalists working in the system had to reach their results by trial and error.

The results of this evaluation were gratifying and gave motivation for continued research and development to get better and more effective results.

Statistics.

In order to get the search profile to correspond with the query as closely as possible, a follow-up of the search results is of great importance. The adjustments and modifications of the search profiles are executed on the basis of the users' evaluations. All users , however, do not evaluate regularly and for that reason programs for search statistics and term statistics have been designed. (See statistical extracts 1-3)

The search statistics record the total number of references printed for each profile after each search.

The term statistics record the "hit terms" and the number of references found by each "hit term" combination. Term statistics are produced for outputs of more than 20 references.

When the search statistics show that a profile has an extremely large output the documentalist examines the term statistics for the profile in question to see what term or terms have caused the output. No changes in the profiles are made without notifying the user.

Statistical extract 1

Search profile
Date 73/02/13
Data base INSPEC
No. of refs.

SEARCH STATISTICS

```
25D1.*********.          .          .          .
25YY.          .          .          .          .
25ZZ.*         .          .          .          .
2501.          .          .          .          .
2541.          .*******   .          .          .
2571.*         .****      .          .          .
26A1.*******   .*         .          .          .
26H1.****      .          .          .          .
26UU.****      .**        .          .          .
26ZZ.*****     .          .          .          .
2621.*******   .          .          .          .
2681.********  .          .          .          .
27H1.*******   .          .          .          .
27R1.*         .**        .          .          .
27ZZ.          .          .          .          .
28H1.**        .*         .          .          .
28R1.          .          .          .          .
29B1.***       .          .          .          .
29H1.*******   .          .          .          .
29UU.**        .          .          .          .
30H1.          .          .*         .          .
30UU.*         .          .          .          .
30YY.*********.*******    .          .          .
30ZZ.          .****      .          .          .
3091.***       .          .          .          .
31C1.          .*******   .          .          .
31H1.*******   .*******   .          .          .
31UU.*******   .***       .          .          .
31ZZ.          .****      .          .          .
3101.*         .          .          .          .
3131.********  .**        .          .          .
32D1.******    .          .          .          .
32ZZ.*****     .**        .          .          .
3261.*******   .****      .          .          .
33E1.****      .*********.          .          .
33R1.******    .**        .          .          .
3341.*****     .          .          .          .
3351.***       .          .          .          .
34B1.*********.          .          .          .
34ZZ.****      .          .          .          .
3421.***       .          .          .          .
35B1.          .          .*         .          .
35C1.          .**        .          .          .
35R1.          .*****     .*         .          .
```

Statistical extract 2

Search profile SDI2F
Date 73/02/13
Data base INSPEC
No. of refs.

T E R M S T A T I S T I C S

1	VIKT=12.00	* LOGIC* ALGORITHM* C91*
1	VIKT=12.00	* LOGIC* AUTOMAT* C91*
1	VIKT=12.00	* LOGIC* DESIGN* C92* B187*
1	VIKT=12.00	* LOGIC* DESIGN* C94*
1	VIKT=12.00	* LOGIC* DIGITAL* AUTOMAT*
2	VIKT=12.00	* NETWORK* DIGITAL*
1	VIKT=12.00	* NETWORK* DIGITAL* FUNCTION* B187* B16*
1	VIKT=12.00	* NETWORK* SEQUENTIAL* B16*
1	VIKT=12.00	*SEQUENTIAL* SYNTHESIS* C91* C94* FLIP F
1	VIKT=2.00	* DIGITAL SYSTEM* DIGITAL* ALGORITHM*
1	VIKT=2.00	* DIGITAL SYSTEM* DIGITAL* DESIGN*
1	VIKT=2.00	* DIGITAL SYSTEM* DIGITAL* DESIGN* C92*
5	VIKT=24.00	* NETWORK* SYNTHESIS* B16*
1	VIKT=4.00	* AUTOMAT* C91* MINIMI*
1	VIKT=4.00	* DESIGN* B187* FLIP FLOP*
1	VIKT=4.00	* NETWORK* SIMULAT* B16*
1	VIKT=8.00	* C92* B187* FLIPFLOP*
1	VIKT=8.00	* FUNCTION* C94* C91* MINIMI*
1	VIKT=96.00	* NETWORK* LOGIC* SYNTHESIS* C94* C92*

Statistical extract 3

Search profile
Date 73/02/12
Data base ISIR
No. of refs.

THE FOLLOWING PROFILES HAVE DURING 5 CONSECUTIVE SEARCHES GIVEN:

NONE	40 RETRIEVALS FROM THE DATA BASE
A030	019X
0161	054X
018X	10VV
03UU	16B1
05A1	35B1
08D1	54D1
17UU	5701
17ZZ	73E1
21C1	
25VV	
27ZZ	
31ZZ	
32R1	
35H1	
35ZZ	
38UU	
40R1	
40TT	
44ZZ	
46G1	
46R1	
47UU	
48ZZ	
49UU	
50C1	
56ZZ	
59ZZ	
62ZZ	
72UU	
74VV	
75ZZ	
76VV	
78UU	
80F1	
85D1	
85YY	
86G1	
88VV	
90ZZ	
92VV	
95R1	
97YY	

There are also statistics for profiles that have not yielded any output from 5 consecutive searches or had outputs of more than 40 references from 5 consecutive searches.

Standard profiles.

In order to meet the information requirements of specialized groups of engineers and scientists interested in the same problems and production fields we have defined a number of standard profiles covering subject areas of common interest. By sharing the costs of the computer search between a number of users we are able to offer these standard profiles at a lower subscription fee than the individual profiles.

List over standard profiles.

08S	Cutting and machining
09S	Numerical control, adaptive control, computers in production
10S	Quality control and quality evaluation in production
11S	High energy forming
12S	Carbon-, boron- and composite fibres
13S	Industrial planning
14S	Industrial maintenance
15S	Steel and steel alloys, mechanical and physical properties
16S	Test methods for construction materials
17S	Corrosion
18S	Welding
19S	Water pollution and water treatment
20S	Air pollution and air treatment
21S	Noise and noise control
22S	Solid waste
23S	Quality of life - general environmental problems
24S	Policy on materials
25S	Industrial housing
26S	Toxic additives in food, detergents, cosmetics etc.
27S	Problems of urbanization
30S	Industrial forecasting
31S	Office, personnel, administrative planning
32S	The same as 31S, but run on ERIC only.

Standard profiles run on data base WOOD only.

79C Prefabricated timber houses
80C Sorting, grading
81C Band saw mills
82C Gang-saw mills
83C Plywood
84C Particle board
85C By-products
86C Circular saw mills
87C Wood preservatives
88C Furnitures
89C Seasoning
90C Timber structures
19D Plaining
20D Timber handling
43Y Veneer

Standard profiles run on data base ABIPC only.

65C Bark
66C Bleaching
67C Coating
68C Cardboard
69C Lignin
70C Tissue paper
71C Liner, fluting and corrugated cardboard
72C Printing
73C Sack paper and kraft paper
74C Paper-machines
75C Newsprint
76C Grinding
77C Continuous sulphate cooking
78C Water purification
46K Process control in pulp and paper industry

Retrospective searches.

Before starting a research project or the manufacture of a new technical product or process, it is important for the manufacturer or research institution to be able to utilize the experiences about projects, manufacturing methods or processes already paid for by others. By an exhaustive retrospective search in the technical literature it can be stated if anyone else has been working with the same problem or even has found a solution to it.

To look through, with conventional methods, all sources where information can be found is very time consuming and almost impossible. Access to information materials is also difficult to get even at large libraries.

Retrospective searches with the application of information processing methods have not been achievable earlier because there was not much literature stored on computer readable media. Nor was it feasible to search large files with the same methods as for ordinary SDI searches. Program systems that use on-line technique for retrospective searches have now been developed which solved this problem.

Since October 1972 the documentation department at the RIT Library is connected to ESRO's (European Space Research Organisation) computer center in Darmstadt, Europe's biggest information network.

At this moment 1.2 miljon references are available for searching in dialogue with the computer via a teleline to the RIT Library's terminal.

ESRO's data bases contain information about practically all subjects within the fields of natural sciences and technology: Tooling machines, vacuum technology, finishing, heat treatment, fibre optic, food technology, measure technique, information processing, strength of materials, new materials, environmental problems etc.

A large part of the stored information consists of reports on research and have not been available for searching before.

The search procedure is quite simple. The search terms are written down on the keyboard and the answer, showing how many references there are to each search term, is displayed on the screen. Then the logic is transferred to the computer center and through a special instruction you can browse through the references and make adjustments in your search profile. Finally you get a printout of those references you choose through a special instruction.

Data bases available for on-line search:

Data bases:	Covered from:
Scientific and Technical Aerospace Reports - STAR	1962
International Aerospace Abstracts - IAA	1962
Nuclear Science Abstracts - NSA	1968
Computerized Engineering Index - COMPENDEX	1969
Metals Abstracts Index - Metadex	1969
Government Reports Announcements - GRA	1970
Electronic Components Databank	1970

On these data bases are stored yearly about 280,000 new references to reports, journal articles, meetings etc. The magnetic tapes with references to these data bases are continuously being sent to ESRO. Negotiations are under way to include CAC, INSPEC, MechEn and others. Simultaneously negotiations are under way in US and Europe to develop fast search routines for large files at a resonable price and to construct inverted compressed data files.

Research and development work carried on in Stockholm indicates that very soon it will be possible to search files of 100,000 - 400,000 references with a set of profiles of 1-25 queries. It will then be possible to search through an annual input of CAC or INSPEC or ISI at a price comparable with that for on-line searches.

Access to the notified information.

The RIT Library gives a quick access to the notified literature. Loan or copies of the documents can be ordered in two ways from the library: By drawing a ring round the reference number on the evaluation form the user marks that he wants a copy of the document. For those users who do not evaluate their references there is a special order form. Both forms are sent to the library and copies of the documents are effectuated as soon as possible. Beside the reference number the date of the list, profile number, and data base or data base code have to be specified. 85 per cent of the loans can be effectuated by the RIT Library from its own collection and other literature can be borrowed from libraries in the country or abroad. To a certain extent this service gives information about how useful the lists of references are to the individual user.

The contact with the users.

During the first five years of SDI service about 4,000 research workers and scientists have been subscribing to the SDI service in periods varying from one to five years. During this period the number of subscribers from the industry has been constant, at about 55-60 per cent of the total number. The rest of the users have been attached to research institutions or universities, engaged in basic as well as applied research; the latter often commissioned by industry.

The demands and expectations that different users have on the coverage and scope of the references are very individual and vary in many aspects, e.g. 1) the number of references in the output, 2) the number of relevant references in propotion to the total number of references, 3) what information the references shall contain, 4) which elements should be searched in the references on the tapes, etc.

The number of retrieved references that the users are willing or interested to examine varies between 5 and 300 references a week. This variation is taken into consideration when formulating the individual search profiles.

The number of relevant references in proportion to the total number of references varies for different users. Some users want a general, broad search and are willing to examine a large number of references even if a fairly large part of these references are irrelevant. For these users a broad search profile is constructed with a logic - search strategy - that is not restricted by many conditions and with search terms significant for a broad subject field. Other users want a high percentage of relevance. For these users a more restricted search profile is constructed with search terms significant for a narrow field and the logic restricted by many conditions. The risk of missing some interesting references has to be taken to reach this high percentage of precision. Variations of this kind are considered in the individual search profiles.

It is as a rule practical to make a broad initial profile and make the restrictions after the first output. As the adjustments in the search profile can be made immediately via the teletype terminal these adjustments and modifications of the profile are not causing much delay to the user.

Individual requests of what elements should be printed in the retrieved references or searched on the tapes can be regarded depending on what information there is on the different tapes. In this respect the RIT Library can influence the tape producers by hinting about special notations wanted by our users.

A new program for the print-out gives the users an opportunity to choose an alternative print-out with abstracts of the documents in the references.

User training programme.

At the RIT Library the user is not requested to design his own search profile. The process from query to an effective search profile is from the user's point of view a delaying factor. Though our system is fairly simple the effectiveness of the search profile is to a high degree dependent on the active interest of the user.

Therefore we have organized seminars with lectures and exercises on the basic principles of computerized current awareness service and the profiling system including profile construction techniques. The users are not only informed about the principles of the SDI system but are also given an introduction to manual information retrieval methods. This is done because the initial effort to define the query is the same for both metods. Through this the user becomes aware of what the SDI service can offer regarding literature coverage and the saving of time.

These seminars are much appreciated by both our present and prospective users. They give an up-to-date presentation of the system and information about changes and novelties in the system. Similar seminars are included in the curriculum for the documentation course for fourth year students at the Institute.

Subscription fees:

SDI: The fee for one search profile of up to 30 search terms is 400 SwCr for twelve months, 250 SwCr for six months.

For students the fee is 300 SwCr and 200 SwCr resp.

Standard profiles:

The fee is 200 SwCr for twelve months' subscription.

Retrospective searches. On-line:

The fee is 500 SwCr per search done by the documentalists. For students the fee is 300 SwCr.

Retrospective searches. Manual searching:

The fee is 500 SwCr per search. Search time is calculated at about 10 hrs.

Conclusion.

During the five years of activities the documentation centre at the Royal Institute of Technology has established itself as an information centre in the fields of science and technology.

The SDI service is now well implemented and its activities are used and appreciated by scientists, research workers and engineers at the universities, research institutions and in the industrial communities. Techniques for on-line SDI-query formulation and query alternation adaptive to user feedback are under development.

The on-line connection to the NASA:s Recon system in Darmstadt enables us to make retrospective searches in interactive mode. Research is going on for linking up the Swedish network for Library Information system - LIBRIS - with international data banks with the objective to achieve a comprehensive information retrieval system for the whole country.

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